atic spindle of Equisetum (Osterhout), nuclear division in the pollen-mother-cells of certain Dicotyledons and Monocotyledons (Mottier), nuclear division in the pollen-mother-cells of *Hemerocallis fulva* (Juel), nuclear division in *Chara fragilis* (Debski), nuclear division and free-cell-formation in asci (Harper), nuclear division and fertilization in *Basidiobolus ranarum* (Fairchild), nuclear- and cell-division in the *Sphacelariaceæ* (Swingle), nuclear division and fertilization in *Fucus* (Strasburger), cytoplasm-structure and nuclear- and cell-division (Strasburger), fertilization (Strasburger). It is encouraging to observe the names of the American botanists, Osterhout, Mottier, Harper, Fairchild and Swingle in this list.—CHARLES E. BESSEY.

ZOOLOGY.

Stichospira paradoxa.—Nov. gen. and sp. of *Ciliata Infusoria* with plate.—Body, when extended, much elongated, consisting of a bulbous posterior part, a long, slender neck, and an anterior part with the peristome and a long corkscrew-like anterior extension curved dorsalward and to the right, bearing the prolongated adoral zone of cilia. When contracted, it is obovoid with the anterior end rather pointed. The substance of the body is slightly yellow. One contractile vacuole is situated in front of the peristome, somewhat to the left and dorsalward, another near the posterior end of the body. Two almost globular endoplasts were seen not very distinctly. In the posterior part there are, as a rule, numerous food-balls and small, strongly-refracting particles. On the right margin of the rather deeply excavated peristome is a broad, thin, hyaline membrane, standing out perpendicularly, ventralward; it appears to be rather stiff and is undulating very slightly (*u m* in fig. 2.). The anus is in the anterior part, to the left of the peristome, and constant. Of cilia there are the following:—

1. The adoral zone with about 30 to 50 transverse series of fine, long cilia from the peristome-angle to the anterior end of the processus, of which this zone is occupying the outer side.

2. One single, stronger, shorter cilium at the anterior end of the zone, and sometimes a smaller one in front of it.

3. A series of about 20 "paroral" cilia just inside of the membrane on the right peristome-margin; they are long, bristle-like, crowded, appearing stiff, but slightly vibrating, longest in the middle of the series, their ends forming a regular curve.

4. "Endoral" cilia lining the gullet from the peristome-angle through the neck to the posterior part.

5. A right marginal series extending from the anterior end to and over the neck; the cilia are rather short and somewhat remote from each other.

6. A left marginal series, beginning to the left of the peristome and extending backward, somewhat oblique; the cilia are short and crowded.

7. Two series of ventral cilia on the neck, between 5 and 6, and posterior to the peristome.

8. A short, oblique group or series of about six long, hair-like, stiff cilia, to the left and somewhat behind the peristome-angle, directed ventralward obliquely.

9. A longitudinal series of cilia of the same kind along the left side of the neck.

10. A similar series on the right side; in both these series the cilia are directed slightly backward when the animal is extended, and forward when it retracts.

11. Fine, stiff, hair-like dorsal cilia or "tactile hairs," in several series of various length; quite short on the anterior processus, longer from the peristome backward; Nos. 9 and 10, and possibly, also, 8, may be of the same category.

12. Some cilia near the posterior end of the body, whose exact grouping and significance are yet to be ascertained.

The size is subject to considerable variation; long. of extended specimens 0·15–0·25 mill.

It seems that the anterior part and neck are made up wholly of ectosarc, and the softer endosarc fills the posterior bulbous part.

The food consists of smallest particles, so far as observed, most bacteria, etc., carried along with the current of water and gathered in the gullet at some distance from the peristome-angle, to a smaller or larger ball (fig. 1 *f b*) which is then passed backward. By the large membrane and the long, dense series of long "paroral" cilia at the right margin of the peristome (fig. 2, *u m* and *par*), standing out perpendicularly, a very effective wall is formed for conducting the current with the minute food particles to the peristome-angle. Larger objects are usually expelled when driven into the peristome, by the posterior adoral cilia directed rather towards the right. But occasionally larger morsels, up to 0·01 mill. diameter, are swallowed. After digestion, the balls (fig. 1, *d b*) are passed forward through the neck, on the left side, to the anus (fig. 1, *a*) situated to the left of the peristome. While passing

along the neck they project considerably over the general level, and seem to be covered only by the cuticula. The anus has its constant place, but is marked by a slight irregularity of the surface only for a short while after the waste ball is ejected.

The animal lives, as a rule, in a cavity of some plant, a living or dead leaf, etc., from which it projects, straight, or curved, at any suitable angle. Very often this dwelling is extended forward by the addition of a tube (fig. 1, *t*) built by the animal itself with small particles of different materials carried along by the current, connected, probably, by some mucus secreted from the body. Sometimes these tubes are rather hyaline and transparent, containing few foreign bodies. Occasionally a specimen is seen in a tube made up entirely by itself. From the cavity or tube, the anterior part of the body is projecting, when extended, to a short distance behind the peristome-angle (usually less so than in fig. 1), while the posterior part is, as a rule, not or very indistinctly visible.

When the animal is emerging from the tube, its anterior part is quite straight, the adoral cilia along the ventral side laid together, directed backward, and resting or vibrating very slightly, as a rule (fig. 4). Then, all at once, they spread out and begin vibrating vividly, and at the same time the anterior processus suddenly turns into the corkscrew-shape, like a spring. Thus extended the animal will keep for a shorter or longer time, in the way of Vorticellidæ, often swaying to and fro, or turning around its axis, and then as suddenly it will retreat deep into its cavity, where it may remain for a few seconds, or minutes, up to several hours, and sometimes probably more. At times an animal may be seen slowly advancing in its tube, about to the aperture, then slowly retreating, and continue doing so for a good while, with the cilia, especially the posterior adorals, slightly vibrating. Possibly this is done for the purpose of respiration.

As already stated, there is considerable variation in size. Each individual is growing, but slowly, even with abundance of food. With the growth of the animal is connected a considerable increase in the number of adoral cilia, as well as probably of some other groups. This is a fact not sufficiently noticed, so far, as to my knowledge, and with it we meet a question of highest interest concerning not only the form under consideration, but all Oxytrichidæ and related groups.[1] It is

[1] It should be borne in mind that in *Oxytrichidæ*, *Euplotidæ*, *Halteria*, etc., in the *Heterotricha* of Stein, in *Amphileptus* and some others (which should range with the Heterotricha), the adoral zone does not consist of a spiral or longitudinal series of single cilia, but of transverse rows of such, each one in the shape of

more than probable that the new rows of cilia are formed at the anterior end of the adoral zone, which is corresponding with the right or aboral end in other groups, for the following reasons: 1. The transverse rows in the adoral zone are always equal and equidistant, so that a new formation between the existing rows is excluded. 2. The foremost rows are short, bearing only a few cilia each; with the increasing size of the animal they become longer, bearing also a greater number of cilia, i. e., the adoral zone grows wider, while at the same time the number of transverse rows is increasing from about 25 or 30 in all, about 18 in front of the peristome, to about 50, or 30 respectively. Thus the foremost rows in a small specimen will be about in the middle of the processus when the animal has become large. 3, In several instances it seemed that the single, shorter, stronger cilium in front of the adoral zone (*c*) was split into two or three filaments, at its end, and so it is probable that it represent and grow out into a newly added transverse row, the more so as a smaller cilium was often seen in front of it, which subsequently would take its place (*c'*, fig. 4).

A group of rather crowded, short cilia is at the anterior end on the right and dorsal sides, evidently the new additions to the right marginal series and the fine, stiff dorsals or "tactile hairs" (see figs. 1, 2, 4, 5, 6).

Binary fission has not been observed directly. To all probability it is going on during retreatment. Many specimens have been rather closely observed during several—up to four—days in succession without any changes indicating fission being noticed on the anterior part, except in size and the number of adoral transverse rows. Lately two animals were seen, side by side, growing to a large size, during three to four days. Both of them were in normal shape, at noon, one day; when seen again, about an hour and a half later, both had changed: the anterior part was shorter and smaller, the end looked as though chopped off, the number of transverse adoral rows was only about 18 in front of the peristome; the cilia were short and showed that peculiar, slow vibration always seen on new cilia during and just after fission in Oxytrichidæ and all ciliates bearing an adoral zone. Evidently they had undergone transverse fission. On the following day both specimens again presented a different appearance (fig. 6): the anterior end was

a fan when spread out. In innumerable instances this was distinctly seen in many species of the different groups named, while the animals were living and in normal condition. Whether the cilia in the transverse series are always separated down to the base, or are coherent so as to form a kind of short "membranelles," may still be an open question.

somewhat club-shaped without any adoral cilia for some distance, but with the single, larger cilium (*c*, No. 2, above) and a group of rather crowded, short, fine cilia on the back. Later, both were of normal form, and again, two days later, the same club-formation was noticed on one of them. These were the only instances where this form was seen, and it is impossible to judge, at present, whether it was an incidental, abnormal formation, or one occurring regularly during growth; yet the former is more probable.

There is one somewhat peculiar and interesting feature about the fission in our species: In almost all other ciliates the two newly formed individuals are of about equal value, even in the Peritricha. In *Stichospira* the anterior animal evidently leaves as soon as separated, while the posterior remains in place in its dwelling. Here, then, fission seems to approach, in a certain degree, gemmation.

Several times specimens were seen free and contracted in the shape shown in fig. 3. Whether they were anterior individuals formed by fission, or such that had been thrown out of their cavities, accidentally, remained in doubt. Both assumptions may be true. On such animals a few cilia, of common form, were seen near the posterior end of the body (see No. 12, above, and fig. 3, *cp*).

From the description and figures it is apparent that *Stichospira* is a ciliate of very peculiar organization. In the formation of its anterior part it resembles the Oxytrichidæ, with which it is to be ranged, but representing a group of its own, owing to the formation of its middle and posterior parts and the mode of life. With the latter moments it resembles, to a certain degree, some heterotrichous and peritrichous ciliates. It may also be said that the highly differentiated apparatus of cilia in the anterior are in a strange contrast with the simple, sack-like posterior part produced by and adapted to the animals's living in a cavity or tube; that is to say, for a form of Oxytrichidæ. And in this connection, the situation of the anus, in the anterior part of the body, is also very significant. This is an exceedingly illustrative example, and rare to such a degree among ciliates, of the mutual impressions of organization and mode of life.

It must be added, however, that the organism under consideration is not without its analogies and homologies. On the one hand, it has much in common with *Freya*, and in a similar way with *Amphileptus*, etc., by the forward extension of the anterior part with the adoral zone in front of the peristome. On the other, it is nearly related with *Stichotricha acuminata* Pty., for which species the first examples seen were erroneously taken, and in allusion to which the generic name was given to our

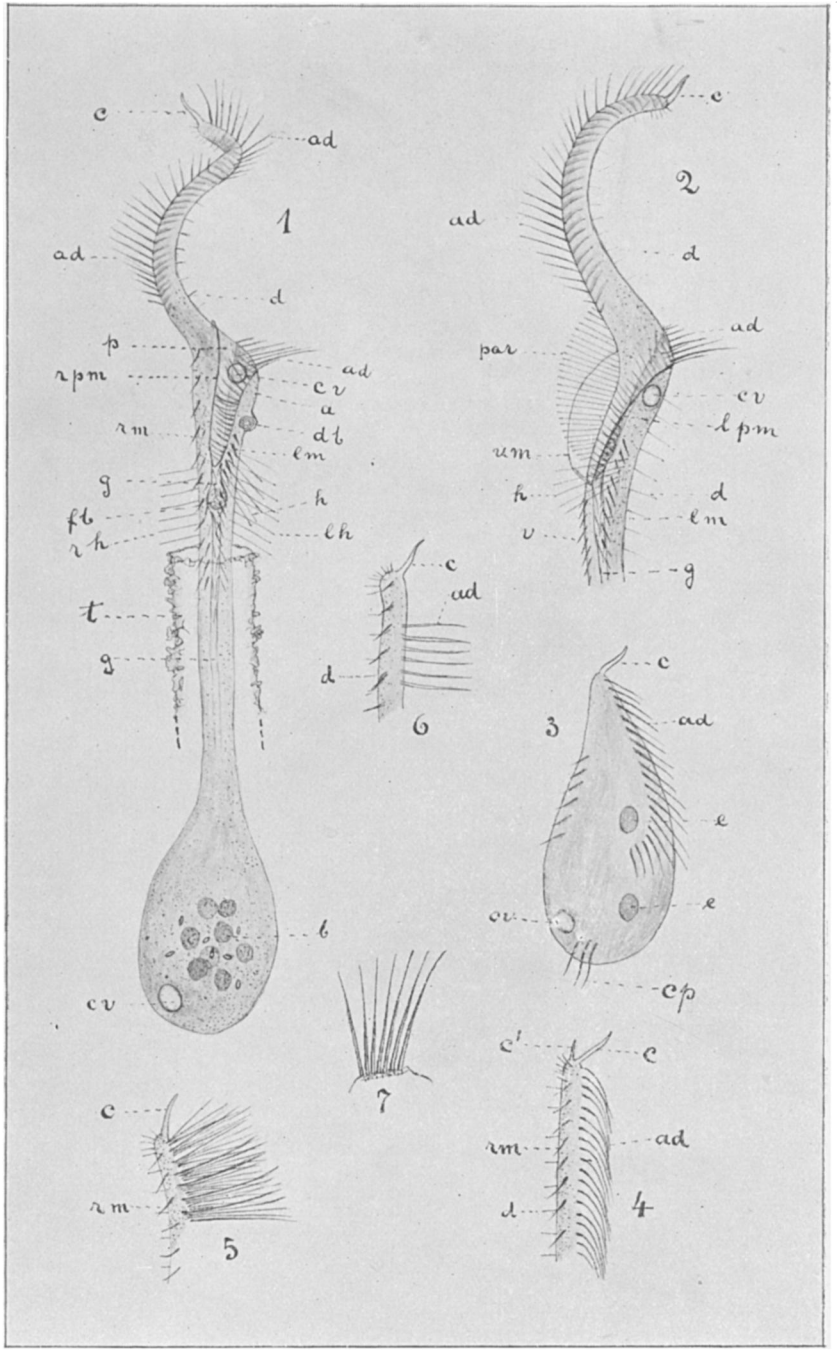
form. Later I had a chance to observe the two species side by side. In *Stichotricha*, likewise, the anterior part is much prolonged, the hair-like cilia are highly developed, and, as it seems, they serve not only for "tactile" purposes, but rather, at least in *Stichospira*, and very probably also in *Stichotricha*, for guiding and directing the various particles passing along with the current of water, partly to be arranged to the tube built by the animal itself, as *Stichotricha* has also the inclination to, at least temporarily, live in cavities or self-made tubes. *Stichospira* must be regarded as a very much differentiated form of the same type, representing a different genus and even group.

The animal was first noticed in March, 1894, when about a hundred specimens were seen, from a small but healthy aquarium kept since early fall. Yet some points of the organization and life-history remained in doubt, and thus publication was deferred. Since May of that year, none were seen until recently, when again several dozen came under my observation, also in an aquarium, in company with many other ciliates, mostly living on, or rather in, small, old stems of Riccia. The observation and examination of this Infusorium presents its peculiar difficulties, as is apparent from the description. Thus, of conjugation and the forming of cysts, nothing has been seen; yet a publication seemed to be not out of place.

EXPLANATION OF THE FIGURES.

t	tube.
c v	contractile vacuoles.
e	endoplasts, or "nuclei" (fig. 3).
p	peristome.
r p m	right peristome-margin.
l p m	left " "
g	gullet, lined with endoral cilia.
f b	food-ball in the gullet.
b	food-balls in the posterior part of the body.
d b	digested and waste food-ball passing to the
a	anus.
u m	undulating membrane.
a d	adoral cilia.
c	single cilium at the anterior end.
c'	additional smaller cilium.
p a r	paroral cilia (fig. 2) in a dense series.
r m	right marginal series of cilia.
l m	left " " " "
v	"ventral" cilia.

PLATE XV.



Stichopira paradoxa Sterki.

h group of long, hair-like cilia to the left of the peristome.
r h series of such cilia along the right side of the neck.
l h the same on the lest side.
d "dorsal" cilia, or "tactile hairs," short on the anterior part of the body, longer from the peristome backward.
c p some cilia near the posterior end of the body.

Fig. 1. Specimen seen from the ventral side, with indication of the tube built by the animal, from which it is projecting more than usually; the cavity in which the posterior part rests is omitted. On the right margin of the peristome (*r p m*) the membrane and the paroral cilia (*u m* and *p a r* in fig. 2) are not, or very indistinctly, visible in this position. The adoral cilia are only indicated by one at the end of each transverse row (conf. figs. 5 and 7).

Fig. 2. Anterior part viewed from the left side. The adoral zone is seen directly in front of *l p m*, through the projecting margin behind *l p m*.

Fig. 3. Contracted specimen, not in cavity; sketch. Others seen were of somewhat different shape.

Fig. 4. Anterior end of animal just emerging from its tube. Adoral cilia laid together and directed backward, resting; the lines indicate not the cilia, but the spaces between the transverse rows.

Fig. 5. The same, with the adoral cilia somewhat diverging.

Fig. 6. The same, as seen in specimens sometime after fission, the adoral cilia are only indicated.

Fig. 7. Single transverse row of adoral cilia, more magnified.

Scale of figs. 1 to 6, × 500. —Dr. V. Sterki.

New Philadelphia, Ohio, March, 1897.

The "Urnes" and the Enigmatic Bodies in the Body-Cavity of Sipunculus.[2]—For some time the existence of certain peculiar bodies in the body-cavity of *Sipunculus* has been known. What their nature is has been a disputed question. Vogt and Young and Fabre-Domerque, influenced by the mobility of the bodies, have thought them autonomous, and have compared them with parasitic ciliated infusoria. Others, among whom must be mentioned Brandt, Ray-Lankester and Cuénot, have considered them as epithelial elements that have

[2] J. Kunstler and A. Gruvel. Recherches sur l évolution des Urnes. Comp. Rend., CXXIV, 309-12.

become free, and as belonging to the organisation of the animal. They have thought that all the transition stages between the simple ciliated epithelial cells of the intestine and the free urnes may be found.

Kunstler and Gruvel assert that the bodies have a different history, and, if the correctness of their observations be granted, we must give up the conclusions that we have supposed well-founded and return to the ideas of Vogt and Young and Fabre-Domerque and consider the bodies as autonomous organisms. But, if they are such, the question arises, What can be their history in the cavity of the young *Sipunculus*, how did they gain entrance, and from whence did they come?

According to these authors the urne is the final stage in a series, and represents the form of the organism or element that is most common. This element becomes flattened and enlarged in its ciliated region, while its hyaline vesicle looses its spherical form. As a result of the change of form, there is produced a large disc having waving movements. While these changes are taking place there appear in the lower side of the disc numerous cellular elements that soon become free and function as reproductive bodies.

The latter have been known under the name of amœbocysts. They are generally provided with numerous long and thin pseudopodia, and sometimes structures resembling undulating membranes. Their granular protoplasm contains two bodies, one colorless, the other dark, that resemble nuclei. In the course of growth the colorless body increases in size faster than its dark companion, and finally escapes from its containing element. There is thus left an element having pseudopodia, and containing a small dark colored body. The pseudopodia become more numerous and smaller, and somewhat later some of them become flagellate at the peripheral zone. They are then minute urnes that soon, by the simple process of growth, become urnes of the normal size.

Besides the urnes and their reproductive modifications, there may be found, in the liquid of the body-cavity of *Sipunculus*, certain bodies that, evidently for want of a better term, the authors call enigmatic vesicles. To a certain extent, these resemble the urnes. By the simple process of fission they produce large cellular plaques composed of two layers of cells or elements. An application of staining reagents to these brings out marked differences. Some of the elements stain readily and deeply, others appear to be scarcely stainable.

In the course of time the clear elements become isolated, repeat the process of division and in their turn produce plaques. The other elements give rise to buds that are nucleated and provided with a hyaline vesicle. The attaching pedicle of the bud becomes greatly lengthened and finally breaking away the bud becomes a free, large amœboid body,

with waving pseudopodia and within which one may recognize clear and dark colored vesicles in different stages of development that later function as reproductive elements.

Sometimes the normal urnes may reproduce by the simple process of fission, the two halves drawing apart. At such times one may find buds developing upon the large clear vesicle that seem analogous to those just described.

The authors promise a memoir accompanied with micro-photographic plates.

Biological Observations on Peripatus.[3]—The observations which Mr. Steel makes upon a large number of specimens of *Peripatus leuckarti* var. *orientalis* Fletch. are of considerable biological interest. Some 579 specimens, 390 of which were females, were collected in New South Wales during the seasons 1894–5–6. He found that the color of individuals is quite variable, but that the variations are such that they may be arranged in four groups: first, those which are blue-black or black, of which the total number of specimens contained 77.5 per cent.; second, black specimens, speckled with brown, which numbered 6.5 per cent.; third, brown specimens with black antennæ, which amounted to 10 per cent.; fourth, specimens entirely brown, of which there were 6 per cent. These colors, he states, seem to be more or less fixed, for, as a rule, the larvæ follow the color of the mother; for example, brown specimens with black antennæ will produce young with the same color characteristics.

Considerable difference was noted between the sizes of the specimens collected in the season of 1894–5 and of those collected in the season of 1895–6. The latter were very small in comparison with the others. The specimens were also rarer during the latter season. The author endeavors to account for these differences by citing the fact that the first season was moist and the second very dry. But whether the large specimens of the first year had died off, or whether the unfavorableness of the second season had decreased their size, he is unable to say.

The food of Peripatus consists entirely of insects such as those found on and beneath decayed logs, and of these the Termites seem to form the animal's favorite food. The animals are sociable and gather in groups and give no evidence whatever of being cannibalistic. The author has fed the animals in vivaria upon dead insects, but has never been able to induce them to eat raw meat.

When surprised by a quick exposure to light, they sometimes eject slime from their cephalic glands, and when seeking prey, if the latter

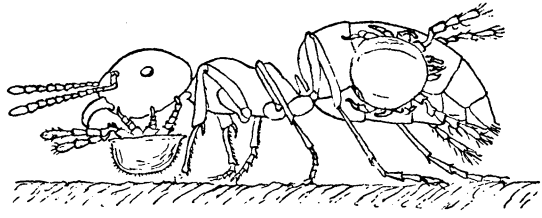
[3] Thos. Steel. Observations on Peripatus. Proc. Linn. Soc. N. S. Wales., XXXI. 97–104.

struggles considerably or is likely to escape, the slime is ejected upon it for the purpose of quieting its struggles. In doing this the animal raises its head and the anterior portion of its body from the ground and ejects the slime strongly in two small streams for some distance. The slime is not acrid, is tasteless, and in is no way irritating to human mucous membranes; but it is very viscid.

The animals cast their skins at regular intervals, very much as do insect larvæ, and the cast skins are usually worked over with the jaws of the animal and swallowed.

The young are born at all times from the middle of November to the middle of March, and are about five millimeters long at birth. Growth takes place at the rate of about one millimeter per month, and from the latter fact the author concludes that the animals must be about two years old when full grown, and from other observations he thinks they must be three years old when they first give birth to young. External parasites have not been found.

A Myrmecophlous Mite.—The brief note by C. Janet[4] on the Mite *Antennophorus uhlmanni*, recalls, one noted some time ago on the relations of *Lepismina polypoda* to ants. This mite is found living as an epizootic parasite on *Lasius mixtus*. Often there is but one parasite to a worker ant, but sometimes there are more, as shown in the figure.



In any case the mites arrange themselves on the host with reference to the median plane of the latter so as not to disturb its equilibrium. If there are two parasites, they occupy opposite sides. The mite lives entirely upon the food disgorged by the ant, which, strangely enough, seems to take pleasure in feeding its parasitic burden whenever called upon by the latter to do so.

The Effect of the Poison of Centipedes.[5]—From several experiments performed by Mr. Norman upon mice and snakes, it appears that the poison of centipedes is so virulent that, if it gets well into the

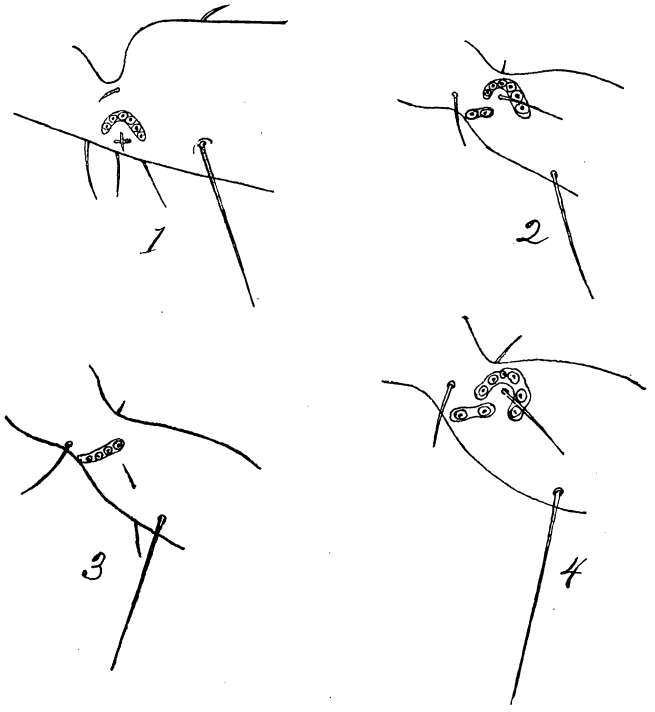
[4] Sur les rapports de *l' Antennophorus uhlmanni* Halber avec le *Lasius mixtus* Nyl. C. K. Acad. Sc. Paris, CXXIV, 583–5.

[5] W. W. Norman, Trans. Texas Acad. Sci., I (1896), 118–119.

circulation of such small animals as mice, they quickly succumb to its action. In the case of one experiment the mouse died within a few seconds after it was bitten; in another, the animal did not succumb until four days had elapsed. The two snakes experimented upon did not seem to be affected. They died, but this appeared to have been due to lack of proper care.

The results of the experiments are so varying that it would be well worth the while of some one to undertake a series of experiments with the poison of centipedes that would result in more definite knowledge as to its effect upon the blood, tissues, etc., as well as to the rapidity of its action when injected into the circulation in different degrees of concentration.—F. C. KENYON.

An Organ on the Femur of Phlœothrips Resembling the Auditory Organ of Locusta.[6]—During his physopod studies Try-



Figs. 1–3. *Phlœothrips tibialis* Reuter ♀. Fig. 1. The base of the anterior, fig. 2. The base of the meddle, and fig. 3. The base of the posterior femur.
Fig. 4. *P. setinodis* Rent. Base of the posterior femur.

[6] F. Trybom, Entom. Tidski, 17, 1896, No. 2–3, pp. 102–4, fig. 4.

bom found near the base of the femur in all three pairs of legs, in all of ten species of *Phlœothrips* studied, a peculiar area covered by a thin, transparent layer of chitin. Generally the areas are curved, but sometimes they are straight. In a specimen of *Phlœothrips tibialis* there was found on the left middle femur a straight area, and on the opposite femur a curved one. Through the thin chitin one may distinguish several dark bodies measuring from three and one half to four microns in diameter, which recall the round structures in the auditory organs of *Locusta* as described by Hensen. The organ is also found in *Thrips salicaria.*

"Delarvation" as a translation of the French "Echenillage."—When one considers the thousands of words to be found in that enormous list of English words, the Century Dictionary, and also the hosts of technical words constantly being proposed, one should hesitate before burdening the language further. But now and then one feels that it will be a conservation of energy to reduce a sentence or a phrase to a single word. How often is this the case in translating foreign words! The German "Anlage" is an example. Some authors have endeavored to introduce it bodily into English, and others to translate it by the old word "fundament," a term that to many a speaker of English recalls to mind something ludicrous. The French "échenillage" is another example.

The word is not uncommon in French literature relating to economic entomology, as the author learned a couple of years ago when collecting and translating literature relative to the gypsy moth. It means to remove larvæ from trees, bushes, fields or from wherever they may be, whether it be by hand picking, by treatment with an insecticide or any other method. There is but one word in English that can be used to express this, and that is the verb "to worm." But there are difficulties involved in its use that are very apparent. One can speak of worming one's cabbages or of sending some one to worm them, without involving any misunderstanding. But when one desires to speak of the process of worming cabbages, i. e., to use the verbal noun, one encounters trouble. First the verbal noun does not seem altogether euphoneous; second, one is, or rather the reader may be, puzzled to know which of the eleven meanings of the verb "to worm" given by the Century Dictonary is meant. He may ask, does it mean the action (1) of moving or squirming like a worm, or (2) of acting slowly and secretly, or (3) of affecting something slowly, or (4) of removing by underhand means, or

(5) of subjecting something to a stealthy process, or (6) of worming out some ones secrets, or (7) of freeing something from worms, or (8) of removing the charge from a gun, or (9) of removing the beard of any oyster or mussel, or (10) of giving something a spiral form, or (11) of winding rope-yarns, etc.?

Some other word seems necessary. One cannot use the term "larvate," for that is already in use, as a past participle in speaking of certain peculiarities of diseases that physicians meet with, and as an active verb in expressing the idea of masking.

The term "delarvate," the etymology of which is evident, is not to be found in the dictionaries and is here proposed as an English equivalent of the French échenillage. In his notes and manuscripts the author has used it constantly to avoid paraphrasing, and has gained time in so doing. Is the word not of sufficient value for general use? —F. C. KENYON.

ENTOMOLOGY.[1]

Dr. Smith's Study of the San Jose Scale.—At the 1896 session of the New Jersey Legislature, $1000 was appropriated to the State Experiment Station for the study of habits and enemies of the San José scale (*Aspidiotus perniciosus*) with a special view to the useful introduction of the latter into New Jersey. Dr. J. B. Smith was commissioned to make the investigations. In the Station report for 1896 Dr. Smith gives a full account of his studies and an admirable discussion of the subject. He visited California in May and found a great division of opinion regarding the usefulness of ladybird beetles as destroyers of this scale. But he found that "there is absolutely no disagreement concerning the beneficial effects of the *Vedalia cardinalis* (Fig. 1) as against the Cottony Cushion scale *Icerya purchasi*. There is no doubt that this insect, once so destructive, has been almost completely exterminated by the *Vedalia*. We do find that occasionally the scale reappears; but a colony of the beetles sent from the office of the local commissioner usually clears them out in a few weeks there-

[1] Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.